

Ticked OFF!

Ticks are pests that live off blood. They find the blood in people and animals. While feasting on their host, ticks can pass along sicknesses like Lyme Disease.

Ticks wait for their food to come to them. Ticks can sense body heat and carbon dioxide—a gas people and animals breathe out—to find prey. When blood sources like humans brush against them, ticks hop on.

Lck, a Tick!

Ticks can be found all over the United States. People living in the shaded states of the country have a higher risk of being bitten by ticks carrying the bacteria that causes Lyme Disease. **Mark an "X" on the state that YOU live in.**



Source: Centers for Disease Control and Prevention (<http://www.cdc.gov/health/>). Cited by the American Lyme Disease Foundation, Inc. (www.aldf.com/).

For more about Lyme Disease, see:
<http://www.cdc.gov/ncidod/dvbid/lyme/>

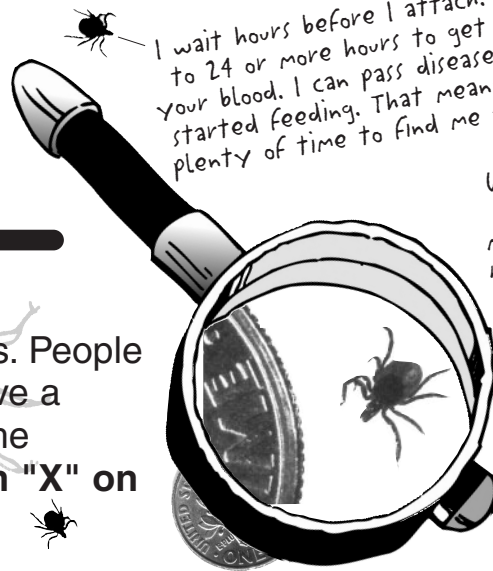
Check and protect
your pets, too.



When ticks attach, they place a barbed mouth-piece into your skin—NOT their head.

Did you know?

- Ticks live in the woods and tall grass.
- They only eat three times: once as larvae, once as nymphs, and once as adults.



Under a magnifying glass you can see me. Otherwise I am really quite small!

Photo Courtesy
Minnesota Department
of Health - Disease
Prevention and
Control



Tips

Avoid Tick Bites!

1. Dress right! See page 11.
2. At home, check yourself from head to toe. Check your clothes, body, and hair for ticks.
3. Ask an adult to pull any ticks off with tweezers.

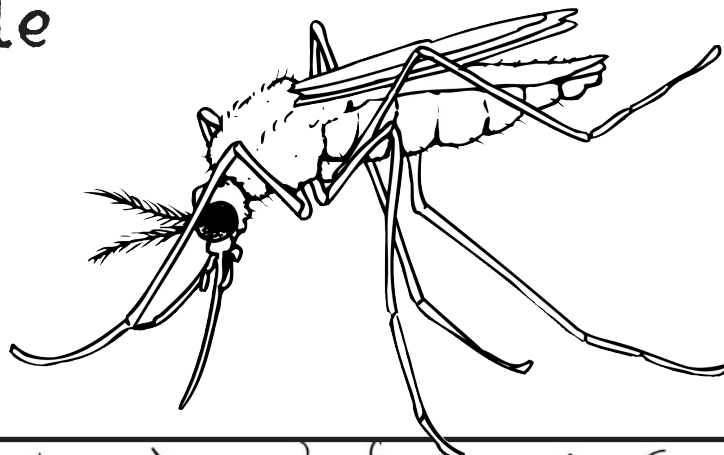
Stop! If you feel like you have the flu after being in the woods, or if you get a rash where a tick bit, see a doctor. These could be signs of Lyme Disease. A doctor can help you get well.

Tip for Grown-ups:

Ticks attach themselves to your body with their mouths. The best way to remove them is with tweezers, making sure not to leave any tick body parts in your skin.



Join the Tree Hole Mosquito Patrol!



Mosquitoes bite and make you itch. They can also make you sick. Some mosquitoes lay eggs in ponds or swamps. The tree hole mosquito can lay eggs in your yard! It breeds any place it finds still or slow-moving water. That includes tree holes that hold water.

This mosquito finds lots of other places to lay eggs, too. You'll see 10 in the picture. Cross them out. Then go on a mosquito patrol in your own neighborhood. Turn over empty pots. Dump water from toys. Don't grow mosquitoes in your area!



**COLOR
THIS**



**Did
You know?**

Some mosquitoes can carry the **West Nile Virus**. Very few mosquitoes carry it, but children can get sick if bitten by one that does.

Skeeter Scat



Tips

- Read labels on all repellents and avoid over-use of pesticide products.
- Wear light, loose clothing to cover your skin.
- Stay inside one hour before and after sunset when mosquitoes are most active.

Mosquito-Eating Machines

Mosquitoes have a place in the food chain, but not on your skin. Bats and birds are mosquito patrols, too. Build a bat house and you'll have fewer mosquitoes!

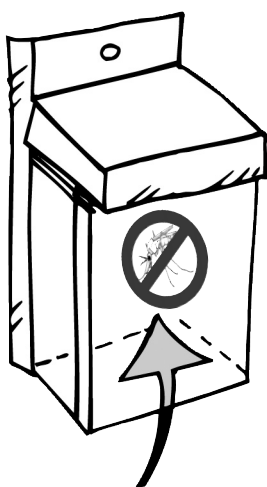
Try This!

Build a Bat House!

- *Woodworking for Wildlife* by Carroll Henderson has a bat house plan. You can build it from one piece of lumber for \$5.00.

For more, see

- <http://www.batcon.org/bhra/bhcritter.html>



Enter at the bottom!

COLOR THIS

If you knew me better, you'd really like me!

If I swoop and zigzag overhead, I am simply catching insects using **echolocation**.

Echolocation is a bat's way to navigate using echoes of its own signals.



What does one big brown bat eat each night? Use the clues to find out!

A bat eats between (A) _____ and (B) _____ mosquitoes and other insects each night.

Clues

How many years in a century? _____

Add a zero. _____

Multiply times 3. _____ (A)

How many pennies in a dollar? _____

Multiply times the number of days in a week. _____

Add one more zero. _____ (B)



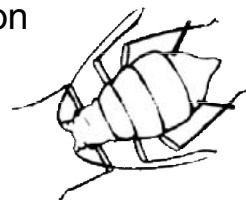
Pests have enemies, too!



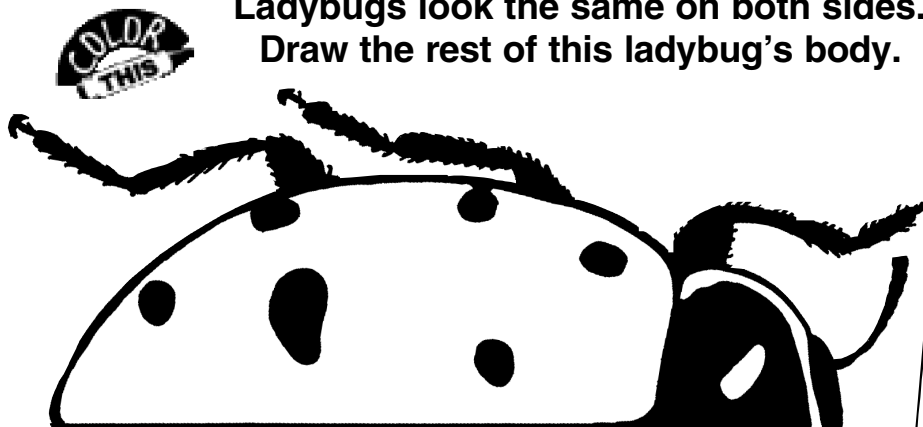
Aphids and Ladybugs

Aphids are tiny insect pests. They suck the sap from plants—vegetables, crops, flowers, and trees. They take away the plant's nutrients, and they can give the plant viruses. Aphids attract even more pests to the plant with the sweet, sticky juices they make.

Natural enemies that gobble up aphids are lacewings, assassin bugs, wasps, spiders, and chickadees. But ladybugs (ladybird beetles) are the champion aphid eaters.



**Ladybugs look the same on both sides.
Draw the rest of this ladybug's body.**



Ladybugs won't harm any of your plants, but they eat many pests that do! Let ladybugs do their work!

For more on ladybugs, visit the National Wildlife Federation's Back Yard Wildlife Habitat Program:
<http://www.nwf.org/backyardwildlifehabitat/goodbugsbadbugs.cfm>. Click on the picture of ladybugs about half way down the screen.

Tip for Grown-ups:

When fighting spider mites or aphids, go for the least toxic ways. You can buy beneficial insects (enemies of pests) such as ladybugs. You can also use insecticidal soaps or wash aphids off plants with your garden hose.



16



Tips

For fighting aphids

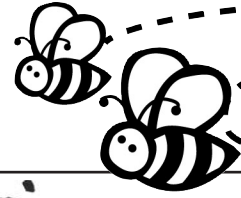
- Pick off aphids from the underside of leaves, or spray them with water.
- Grow plants such as marigolds that attract aphids' natural enemies.
- Buy a bag of ladybugs from a garden nursery. Set them free in your yard.
- Many trees, shrubs, and flowers have resistance to aphids. Call your local agricultural extension service to identify resistant types for your yard.

- When it hatches, a ladybug larva will eat about 400 aphids. As an adult, it may eat up to 5,000 more aphids!
- Insect sprays are the ladybug's number one danger!



What's all the BUZZZZZZzzz?

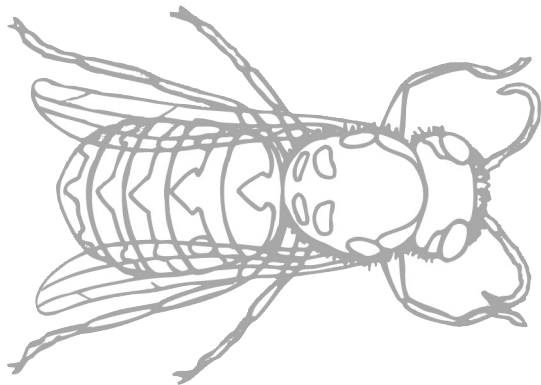
Honeybees and wasps sting to defend themselves, NOT to attack. For bees and wasps, stings are a good way to keep people from bugging them. Bee stings hurt. They can even be deadly if someone is allergic.



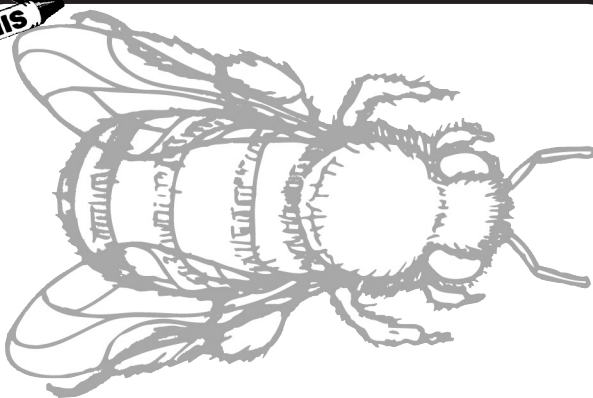
Did You know?

- *Honeybees collect pollen and carry it in a basket of stiff hairs on each hind-leg. When they rest, their wings are flat.*
- *Wasps do not have “pollen baskets” and do not collect pollen. When they rest, their wings are folded back and look narrower than a bee’s wings.*

Which is which? Label and color the wasp and the honeybee. Circle the pollen baskets on the honeybee.



A



**COLOR
THIS**

A circular logo with the word "Least" in a script font and "TOXIC" in a bold, sans-serif font. In the background, there is a silhouette of a person sitting on a bench, possibly representing a child or a person in a vulnerable position.

Tips

Prevent Stings!

Try not to attract bees. If they come around, **don't frighten them**. Check what you should do in areas with bees:

- ☐ Avoid using scented products. This means hair spray, scented soaps, perfume, and lotions.
- ☐ Avoid brightly colored clothes, especially flowered patterns.
- ☐ Keep food and soda cans covered.
- ☐ Wear hats, shoes, and long pants.
- ☐ If a bee comes around, hold very still.
- ☐ If a bee lands on you, don't swat at it. Don't panic! Just blow at it gently. It will move.



First Aid

If you get stung, have an adult remove the stinger as soon as possible.

- Wash the sting with soap and water.
- Put ice or cool water on it for 10 to 30 minutes.
- To ease the pain and itching, try putting one of these on the sting: alcohol wipes, or a paste made of baking soda and water or meat tenderizer and water.

A. A bee flying backwards.

Q- What are you doing?

Tip for Grown-ups:

Tip for Grown-ups:
Keep a bee sting kit handy at home and in the car. If you or a family member is allergic to bee stings, ask your doctor what you need to have on hand.



Without pollinators, we wouldn't have agriculture!

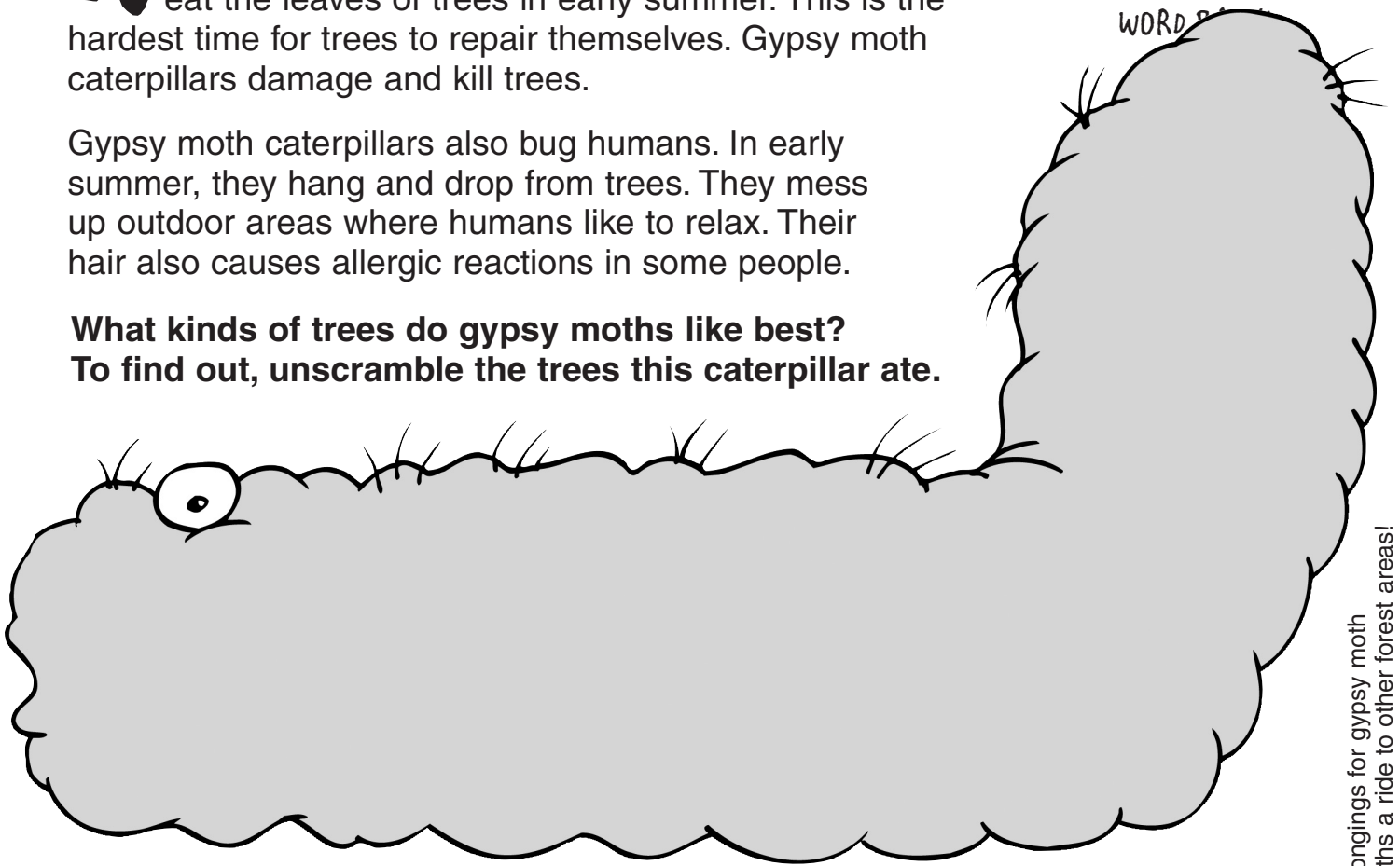


Monster caterpillar

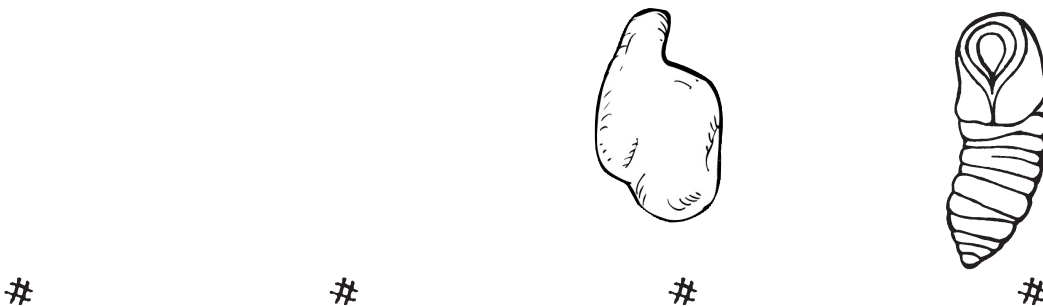
What's the number one tree pest in the USA? It's the gypsy moth caterpillar. These large, hungry pests eat the leaves of trees in early summer. This is the hardest time for trees to repair themselves. Gypsy moth caterpillars damage and kill trees.

Gypsy moth caterpillars also bug humans. In early summer, they hang and drop from trees. They mess up outdoor areas where humans like to relax. Their hair also causes allergic reactions in some people.

What kinds of trees do gypsy moths like best?
To find out, unscramble the trees this caterpillar ate.



Learn to identify the gypsy moth in every stage of development.
Number the life cycle stages in right order, from egg to adult.



<http://www.fs.fed.us/ne/morgantown/4557/gmoth/>

Tip for Grown-ups:

When planting trees, choose species that gypsy moths don't eat. Try Ash, Dogwood, Juniper, Lilac, Sycamore, Arborvitae, Honeylocust, or Northern Catalpa.

Travelers and campers beware! Check your belongings for gypsy moth caterpillars and pupal cases. Don't give gypsy moths a ride to other forest areas!

Wise up to WORMS

EXCUSE ME,
you're standing on
20 nematodes (microscopic parasites and predators),
200,000 algae (microscopic plants),
yards of fungi,
thousands of protozoa,
and up to a billion bacteria...
in 1 teaspoon of soil!



Healthy plants more easily resist pests. Good soil grows healthy plants. And earthworms help make good soil.

Earthworms are little "soil plows." They move bits of soil and make tunnels. This lets in air and water for animals and plants in the ground. Worms carry leaf bits and other materials into the soil, making it richer for plants. Earthworms eat soil and leave castings, little piles or pellets ("worm poop"). Castings hold nutrients that passed through the worm, and they improve the soil. Way to go, worms!

Why do you think robins tug so hard to pull earthworms from the soil?

Try This!

Worm - a - rama

A cool, moist day or evening is a great time to find earthworms. Look in garden soil, vacant lots, lawns, parks, or pastures.

1. Look at the soil surface. Castings are clues.
2. Dig a spadeful of soil. Sort through it for earthworms. Look at them through a hand lens. Look for:

Setae (bristles that help worms grip soil and crawl)

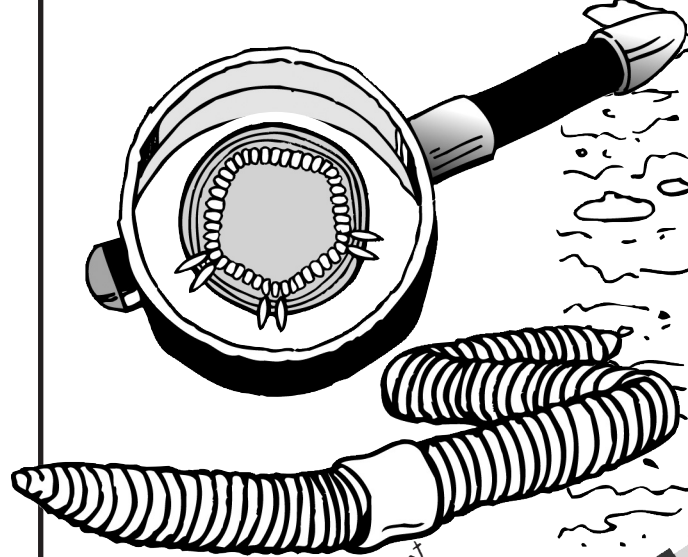
Slime coating (keeps skin moist so worms can breathe)

Front end (usually goes forward first)

Clitellum ("collar" or band that's only on adult worms)

3. After you study the worms, put them back on the soil, please.

Label the clitellum, setae, and front end.



COLOR THIS

Worms can turn your old food into plant food. Try vermicomposting (composting with worms). For tips on how to vermicompost, see:
<http://www.niehhs.nih.gov/kids/worms.htm>

Tip for Grown-ups:

A healthy lawn always has critters that help keep pests under control! **Remember:** Pesticides can kill the helpful critters that keep your soil healthy.

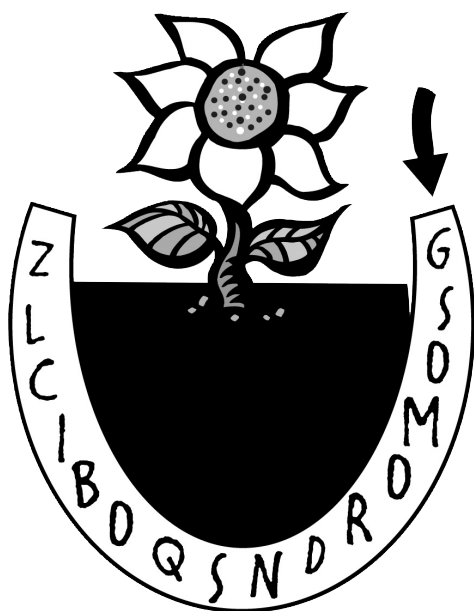
A baby robin will eat 14 feet of earthworms before it leaves the nest!

Did You Know?

Crazy about Compost

Composting saves landfill space and turns garbage to goodness. Try it at home or at school!

What do you get from compost? To find out, start at the arrow and write down every other letter in the space below.



Loose soil makes it easier for plant roots to spread out.

Tip for Grown-ups:





Use compost instead of chemical fertilizers. It's earth-friendly, effective, and free. Spread compost over the ground at the base of plants to give them needed nutrients.

For an informative slideshow about composting for kids, see:
<http://aggie-horticulture.tamu.edu/sustainable/slidesets/kidscompost/cover.html>

Try This!

Make your own compost.

You need:

- **Garbage** , OR , at least 3 feet wide and 3 feet deep
- Big plastic **garbage bags** to line the  or 
- **Soil** (with earthworms and bugs)
- **Twigs or wood chips**
- **Compost ingredients**
- A long **stick** or **shovel** to stir the compost

Before you start:

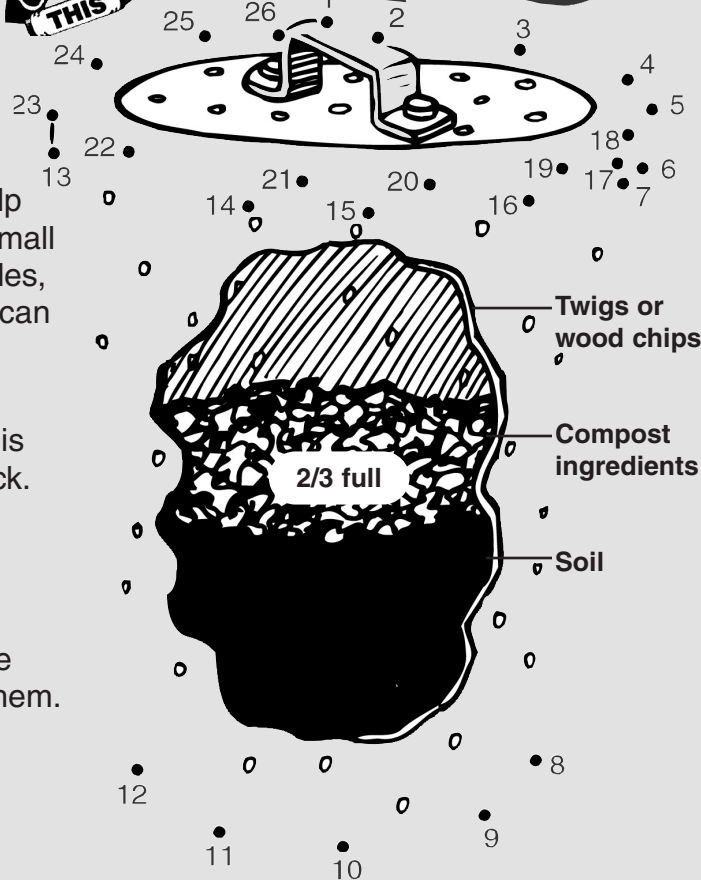
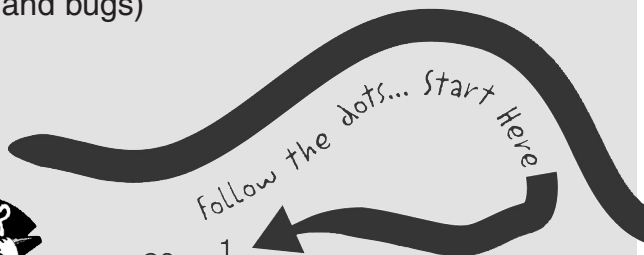
Ask an adult to help you poke 25–30 small holes in the lid, sides, and bottom of the can for air and water.

Step 1. Build up layers. Each layer is about 8 inches thick.

Step 2. Pour on enough water to moisten the pile.

Step 3. Make more layers and water them.

Step 4. Each time you add compost ingredients add a little soil.



Let nature's recyclers go to work!

Use the stick or shovel to mix the pile every two to four days. In one or two months, your compost will become dark brown and crumbly. It is ready to use on your lawn, houseplants, or garden!



Don't put meat, dairy products, or animal poop in your compost. They will make it smell bad—and attract pests!!

Don't miss Mulch

MULCH is a layer of nonliving materials. People can spread it on top of the soil around plants. Why use mulch? Mulch shades and cools the soil. It keeps moisture in the soil. Mulch protects the soil from packing down. Best of all, it stops pesty weeds from growing. Mulch can be:

- Wood chips
- Dry leaves
- Grass clippings
(with NO weeds or chemical weed killers)
- Rocks
- Compost

Compost ingredients:

Fill in the missing vowels.

A c _ ff _ _

gr _ _ nds)

B gr _ ss

cl _ pp _ ngs

C f _ _ d scr _ ps

D d _ c _ y _ ng

l _ _ v _ s

E v _ gg _ _

p _ _ ls

G

fr _ _ t
c _ r _ s

Try This!

How thick should a mulch layer be? See for yourself!

First, choose two plants growing in your garden, yard, schoolyard, or nearby park. Then...

1. Put 1 inch of mulch around the base of plant #1.
2. Put 3 inches of mulch around plant #2.
3. Check in one month.

I predict _____.

This is what happened: _____

What I want to know now: _____

Go on a Mulch Hunt!

How many places can you find mulch around plants?

- | | | |
|-------------------------------------|--|-------------------------------------|
| <input type="checkbox"/> Gardens | <input type="checkbox"/> At home | <input type="checkbox"/> Parks |
| <input type="checkbox"/> Schoolyard | <input type="checkbox"/> Neighbor's yard | <input type="checkbox"/> Boulevards |

Place	Kind of mulch	Any Weeds?	
		Yes	No

Tip for Grown-ups:

Avoid "beaver lodge" mulching around trees. Spread the mulch evenly and leave a 3–4 inch air space around the base of your tree.

THE WEB OF LIFE

Did you know that there are many more kinds of insects on earth than any other kind of living creature? It's hard to imagine, but 95% of all the animal species on the earth are insects! Millions of insects can exist in a single acre of land! Over one million species have been discovered by scientists, and they think that there might be ten times that many that have not been named yet! All of these insects are part of what is called the "web of life."

Draw and color a picture with a critter you read about in this book.

Show: what it eats
what eats it
if it helps something grow

Add other organisms to your picture to make a web of life.



Think:

- What does it eat?
- Does it help something grow?
- Is it food for another creature?

Everything has a place
in the web of life.

**Tell a friend or parent
what this means.**



Plan for pesticide safety!

Care for Your Plants, Family, and Pets

Sometimes people buy and use pesticides. Pesticides are chemicals that get rid of pests. They are poisons. Pesticides may accidentally get into our bodies and make us sick. They can get into our bodies if we touch them, breathe them, or swallow them. Find pesticides in the picture. Underline words that warn you that they are poisons.



Think Again! Talk with your family:

1. Do lawns and parks really need to be totally weed free?
2. How do some insects help your lawn and plants? Do you really need to get rid of ALL insects?
3. Can you put up with fruits and vegetables that aren't perfect—when they are grown without pesticides?

Tip for Grown-ups:

Teach your children that pesticides are poisons, something they should never touch or eat. Pesticides are only for grown-ups to use. Lock up all household, lawn, and garden chemicals. Store them in original containers with labels. Remove children, pets, and their toys from any area where pesticides are being applied, indoors or out. For more information about pesticide safety, visit our Web Site at: <http://www.epa.gov/oppfead1/Publications/catalog/> and click on "Citizen's Guide to Pest Control and Pesticide Safety" and on "Integrated Pest Management (IPM) in Schools" under "General Consumer Publications." You can obtain free copies of EPA publications by calling the National Service Center for Environmental Publications at 1-800-490-9198.



Tips

Be safer from pesticides!

- Either take your shoes off at the door or wipe shoes carefully on a rug-type door mat. How would this help?

- Always store pesticides in their original container. How would this help?

- Wash fruits and vegetables with water. Scrub them with a brush. Peel them if possible. How would this help?

Are you Qualified for Pest Patrol?

Match each pest problem with the least toxic way to attack it.
Then try these ways when you need to pester pests!

Choosing from many ways to manage pests is called integrated pest management, or IPM.

Do you know how to prevent each of these pests from becoming a nuisance? Draw a line to connect each question with the correct answer. Need help? Look throughout this book to find the answers.

- | | |
|---|--|
| 1 You see purple loosestrife. What do you do? | A Tuck your pant legs into your socks when walking in tall grass or areas where these insects may live. |
| 2 How do you keep roaches out of your home? | B Be very still. Don't panic! Just blow at it gently. It will move. |
| 3 What should you do to avoid tick bites? | C Pull it up right away. Put the pieces in plastic bags. |
| 4 How do you keep mosquitoes from using your yard to lay eggs? | D Make sure there are no open containers with water, where these biters can breed. |
| 5 A bee lands on you. What do you do? | E Keep food in closed containers, clean up crumbs, and take the garbage out every day. |



With the right information and tools, we can solve our pest problems... **AND** be friends to Earth and nature!

That's IPM!

Starlings and some other songbirds use natural pest-killers. They line their nests with special plants that give off chemicals that help keep tiny, blood-sucking animals away from their young.



Tip for Grown-ups:

For more information on IPM see www.ipminstitute.org

Did you know?

Glossary

Allergic reaction - Can include rash, itching, swelling, sneezing, runny nose, or trouble breathing due to contact with things a person is allergic to.

Bug - General term for insects. The term “bug” refers to insects with two pairs of wings and “beak” mouthparts for piercing and sucking plant juices or other insects.

Castings - “Worm poop” that forms pellets or small piles. Earthworm castings put nutrients back into the soil.

Caterpillar - What a moth or butterfly looks like in the larval stage of its life cycle.

Compost - A mixture of organic leftovers that may include rotted plant materials, manure, and eggshells. Added to your garden, it nourishes the soil and plants.

Insect - An organism with three body parts (head, thorax, abdomen) and three pairs of jointed legs. Most numerous type of creatures on earth.

Insecticide - A pesticide that kills insects.

Integrated Pest Management (IPM) - Choosing among various ways to treat pest problems. The goal is to cause least harm to the environment.

Larva - The second developmental stage for an insect that has a four-stage life cycle: egg, larva, pupa, adult.

Lyme Disease - A flu-like illness caused by the bite of an infected deer tick.

Mulch - A layer of material that gardeners place over the soil to reduce weeds and hold moisture.

Native - A plant or animal that is an original inhabitant of where you live.

Natural Enemy - Something existing in nature that kills or eats an organism.

Nutrients - Substances that organisms need to live and grow.

Nymph - A young insect that has not yet developed into its adult stage. Nymphs look like adults but lack fully-formed wings.

Organism - A living plant or animal.

Parasite - An organism that lives off another organism in a way that harms it.

Pathogen - Something that causes disease or death in an organism.

Pest - Something that shows up where you don't want it. Examples can include weeds, insects, mold, rodents, and bacteria.

Pesticide - A substance used for keeping pests away, killing them, or reducing their numbers. EPA registers — or licenses — pesticides.

Poison - A substance that kills, injures, or impairs an organism through chemical action.

Predator - An organism that kills and eats other organisms.

Prey - An animal that another animal hunts for food.

Spore - A single plant or animal cell that is able to grow into a new plant or animal.

Toxic - A word that means “poisonous in certain amounts.”

Weed - An unwanted plant.

Web Resources

Just for Kids

A Roach Prevention Activity Website for Kids (U.S. Environmental Protection Agency (EPA))
<http://www.epa.gov/pesticides/kids/roaches/english/>

Backyard Wildlife Habitat Program (National Wildlife Federation)
<http://www.nwf.org/backyardwildlifehabitat/>

Bugged by Bugs" (Girl Scouts Mile Hi Council)
<http://www.buggedbybugs.girlscoutsmilehi.org/>

Criteria for Successful Bat Houses (Bat Conservation International)
<http://www.batcon.org/bhra/bhcritter.html>

Composting for Kids (Texas A & M University)
<http://aggie-horticulture.tamu.edu/sustainable/slidesets/kidscompost/cover.html>

Green Squad (National Resource Defense Council)
<http://www.nrdc.org/greensquad/>

Gypsy Moth in North America (USDA Forest Service Northeastern Research Station)
<http://www.fs.fed.us/ne/morgantown/4557/gmoth/>

Kidzone (The National Wildlife Federation)
<http://www.nwf.org/kids/>

Thinking Fountain: Dandelion (Science Museum of Minnesota)
<http://www.smm.org/sln/tf/d/dandelion/dandelion.html>

Vermicomposting Kid's Page (National Institute of Environmental Health Sciences, U.S. Department of Health and Human Services)
<http://www.niehs.nih.gov/kids/worms.htm>

Who Wants to be an IPM Super Sleuth? (The IPM Institute of North America)
<http://www.ipminstitute.org/supersleuth.htm>

For Teachers, Parents, and Other Caregivers

Audubon at Home (National Audubon Society)

http://www.audubon.org/bird/at_home/index.html

Centers for Disease Control and Prevention's Lyme Disease Home Page (Centers for Disease Control, U.S. Department of Health and Human Services)

<http://www.cdc.gov/ncidod/dvbid/lyme/>

Citizen's Guide to Pest Control and Pesticide Safety (U.S. Environmental Protection Agency (EPA))

http://www.epa.gov/oppfead1/Publications/Cit_Guide/citguide.pdf

Cooperative State Research, Education, and Extension Service State Partners
(U.S. Department of Agriculture)

<http://www.reeusda.gov/1700/statepartners/usa.htm>

Green Landscaping: Green Acres (EPA)

<http://www.epa.gov/greenacres/>

Health Topics A to Z (Centers for Disease Control, U.S. Department of Health and Human Services)

<http://www.cdc.gov/health/>

How to Use Repellents Safely (EPA)

<http://www.epa.gov/pesticides/factsheets/insectrp.htm>

Integrated Pest Management in Schools (EPA)

<http://www.epa.gov/pesticides/ipm/brochure/index.htm>

Mid-Atlantic Region Green Landscaping (EPA - Region 3)

<http://www.epa.gov/reg3esd1/garden/index.htm>

Outsmarting Poison Ivy and Its Cousins (U.S. Food and Drug Administration)

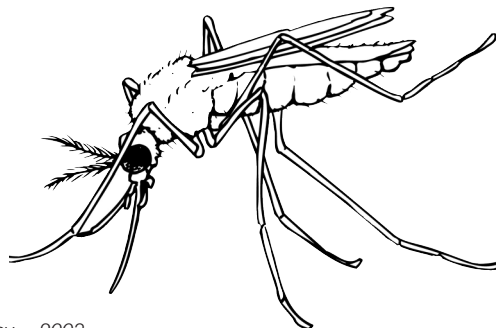
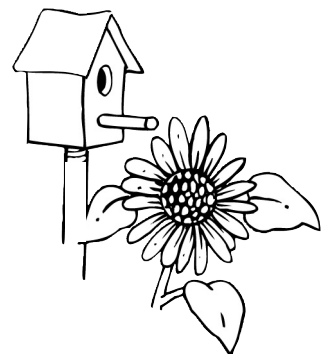
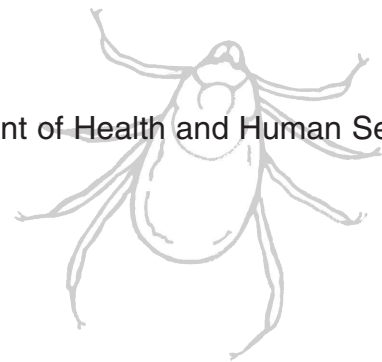
http://www.fda.gov/fdac/features/796_ivy.html

The American Lyme Disease Foundation (American Lyme Disease Association)

<http://www.aldf.com/>

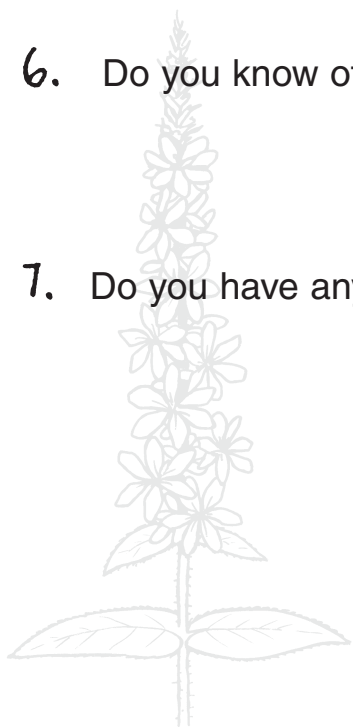
Wildlife Invasive Species Team (The Nature Conservancy)

<http://tncweeds.ucdavis.edu/>



Customer Feedback Form

1. How did you find out about this activity book?
2. If you are a teacher, what grade do you teach?
3. What activities did you find most useful and why?
4. Which activities were least useful and why?
5. Do you have any suggestions for additional activities, Web links, or resources that we might include in a revised activity book?
6. Do you know other people or organizations that might find this book useful?
7. Do you have any other suggestions?



Please send, fax, or e-mail your completed form to:
Kathy Seikel, Office of Pesticide Programs
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW (7506C)
Fax: (703) 308-5558
seikel.kathy@epa.gov

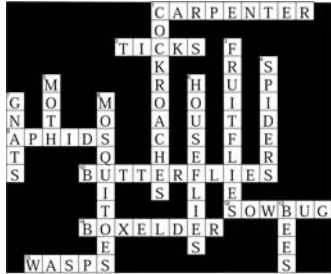
Thanks for your comments!!

Answers

PESTS OR GUESTS, p. 1

1. P, grub
2. P, worm
3. G, bee
4. P, cockroach
5. G, spider
6. P, mosquito
7. P, ants
8. P, wasp

INSECT PESTS AND PALS, p. 2



THE 3 P'S IN ACTION, p. 3

1. parasite
2. pathogen
3. predators

GREEN, GREEN GRASS, p. 6

1. Grass needs nothing.
2. fertilizer
3. nothing
4. fertilizer

PURPLE PLAGUE, p. 8

Florida, Hawaii

BEWARE, p. 9

Milfoil

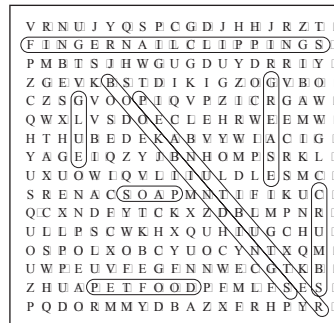
OUTSMART THOSE PESTS, p. 10

1. birdhouses, sunflowers
2. toads, slugs
3. garbage
4. crumbs
5. screens
6. tomatoes

MAZE, p. 11

Pests can get into any opened or spilled containers.

COCKROACH MENU, p. 12



MOSQUITO-EATING MACHINES, p. 15

3,000 and 7,000 mosquitoes

WHAT'S ALL THE BUZZZ?, p. 17

- A. wasp
- B. honeybee

GYPSY MOTH, p. 18

1. oak
2. aspen
3. poplar
4. apple
5. crabapple
6. birch
7. maple
8. willow
9. basswood
10. box elder

CRAZY ABOUT COMPOST, p. 20

Good soil.

COMPOST INGREDIENTS, p. 21

- A. coffee grounds
- B. grass clippings
- C. food scraps
- D. decaying leaves
- E. veggie peels
- F. eggshells
- G. fruit cores

ARE YOU QUALIFIED FOR PEST PATROL?, p. 24

1. C
2. E
3. A
4. D
5. B



Photo Courtesy U.S. Department of Agriculture.

Photos Courtesy U.S. Department of Agriculture.

Photo Courtesy Minnesota Department of Agriculture.



Photo Courtesy Minnesota Department of Transportation.